

Introduction to Computers

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Computer Memory

- Computer memory is an electronic device which can store data and information, such that they can be retrieved, as and when required.
- Computer memory are of two different types, named as primary memory and secondary memory.
- The Primary memory and Secondary memory can be differentiated as follows:

Difference between Primary Memory and Secondary Memory

Primary Memory	Secondary Memory
1. Primary memory resides inside the computer and hence they are also called Internal Memory.	1. Secondary memory resides outside the computer and hence they are also called External Memory.
2. Examples of Primary Memory are: RAM - Random Access Memory ROM - Read Only Memory	2. Examples of Secondary Memory are Hard disk, Pen drive, Compact Disk (CD), Digital Versatile Disks (DVD), Magnetic Tapes etc.
3. Programs and <u>data required by those programs</u> are stored in the RAM, during execution of a program.	3. User data and information are stored by the user in secondary memory.
4. <u>The computer</u> uses primary memory to store and retrieve data for execution of a program.	4. <u>Users stores</u> the secondary memory to store and retrieve user data, as per their requirements.
5. Primary memory storage (RAM) is <u>temporary in nature</u> - RAM is <u>volatile in nature</u> and data stored here gets erased, once the program execution is over or the computer is switched off.	5. Secondary memory storage is permanent in nature - Data once stored never gets deleted, unless one deletes them exclusively.
6. There is a <u>limitation</u> of primary memory storage capacity - it has limited storage capacity.	6. The storage capacity of Secondary memory is <u>unlimited</u> - It has infinite storage capacity.
7. Primary memory is <u>very fast</u> in data storage and retrieval.	7. Secondary memory is <u>slow</u> in data storage and retrieval.
8. Primary memory is <u>costly</u> .	8. Secondary memory is <u>cheap</u>

Booting

- **Booting is the process of starting a computer or a computer-embedded device.**
- **Three activities are performed, when a computer is switched on, or is booted:**
 - 1. POST operation - Power On Self Test. The computer tests whether power is reaching to all parts of the computer and its peripherals.**
 - 2. Checks the entire memory space of the RAM.**
 - 3. Loads the operating system in the main memory - i.e. the RAM.**
- **All these activities are performed by executing the programs hardwired in the ROM.**
- **These programs are written in the ROM by the manufacturer of the computer - in the factory.**
- **The first program or set of instructions that runs when the computer is switched on is called BIOS or Basic Input Output System. BIOS is a firmware, i.e. a piece of software permanently programmed into the hardware.**
- **If a system is already running but needs to be restarted, it is called rebooting. Rebooting may be required if a software or hardware has been installed or system is unusually slow.**

There are two types of booting –

- 1. Cold Booting – When the system is started by switching on the power supply it is called cold booting. The next step in cold booting is loading of BIOS.**
- 2. Warm Booting – When the system is already running and needs to be restarted or rebooted, it is called warm booting. Warm booting is faster than cold booting because BIOS is not reloaded.**

Computer Classifications

Historically computers were classified according to processor types because development in processor and processing speeds were the developmental benchmarks.

Earliest computers used vacuum tubes for processing, were huge and broke down frequently. However, as vacuum tubes were replaced by transistors and then chips, their size decreased and processing speeds increased.

All modern computers and computing devices use microprocessors whose speeds and storage capacities are increasing day by day. The developmental benchmark for computers is now their size. Computers are now classified on the basis of their use or size –

- **Desktop**
- **Laptop**
- **Tablet**
- **Server**
- **Mainframe**
- **Supercomputer**

Difference between Hardware and Software

Hardware	Software
1. Hardware is any <u>physical device</u> used in or with our computational devices.	2. Software is a <u>collection of programming code</u> installed in our computer hardware, so that it functions as per requirement of user.
3. Hardware are <u>tangible</u> things, i.e. that is, it can be touched and felt by our hands	4. Software are <u>intangible</u> things, which cannot be touched or felt.
5. Examples are Monitor, Printer, Keyboard, Mouse, Processor, Memory devices etc.	6. Examples are MS Word, MS Excel, Paint, Page Maker, Photoshop, Tally etc.